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The mating of *Phidippus princeps*

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THE MATING OF PHIDIPPUS PRINCEPS. D.E. Hill

Recently I attempted to mate a series of adult males and females of *Phidippus princeps* (Peckham 1883), one pair at a time, in an open arena on a desk top, much as Crane (1949) did with a number of salticids. The spiders (Figs. 1, 2) were originally collected as immatures in August, 1976 from a very dense Population living atop *Euphorbia esula* herbs in an old field habitat which has since been destroyed by the advancement of "civilization" in the form of a paved parking lot. For historical interest, the locality was in Hennepin County, Minnesota. About 15 pairs were observed initially.

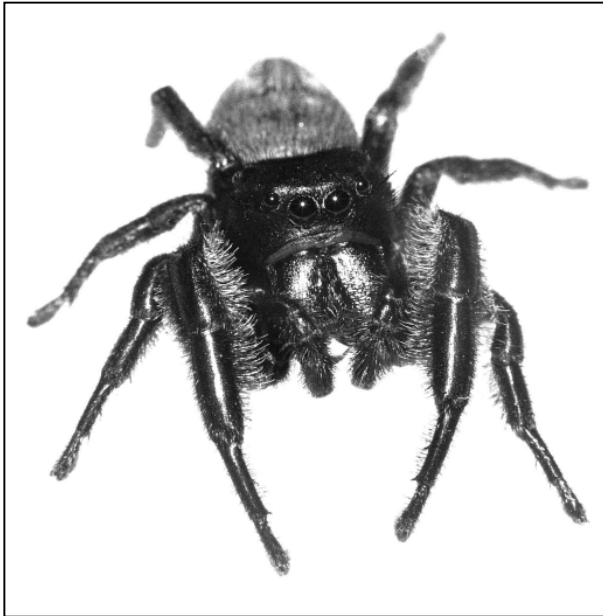


Fig. 1. (X 7) Adult male *Phidippus princeps*. Black with dull rust-red to orange scales on the dorsal opisthosoma and a group of white scales on the dorsal surface of the femur of each pedipalp.

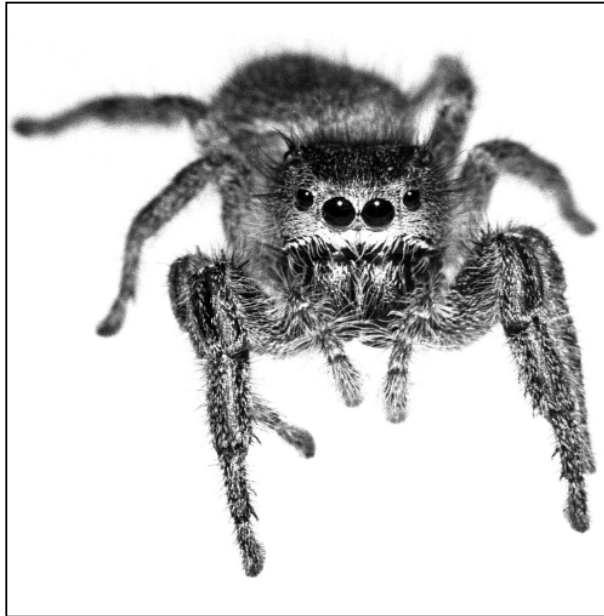


Fig. 2. (X 7) Adult female *P.princeps*. Uniformly tan to light-brown with a white face and white scales extending onto the chelicerae; four hair pencils of the anterior prosoma are characteristic of the genus.

The first attempted mating was essentially a failure, as the females invariably stalked the fleeing males as prey. At first the males would circle the females in a series of steps as follows: The female would first orient toward the male as if in preparation for her attack. In response the male, with his forelegs outstretched laterally and elevated, would move away from her direct line of vision, orienting at an angle to her sagittal plane, thus apparently removed from the stalking range of her AME (Fig. 3).

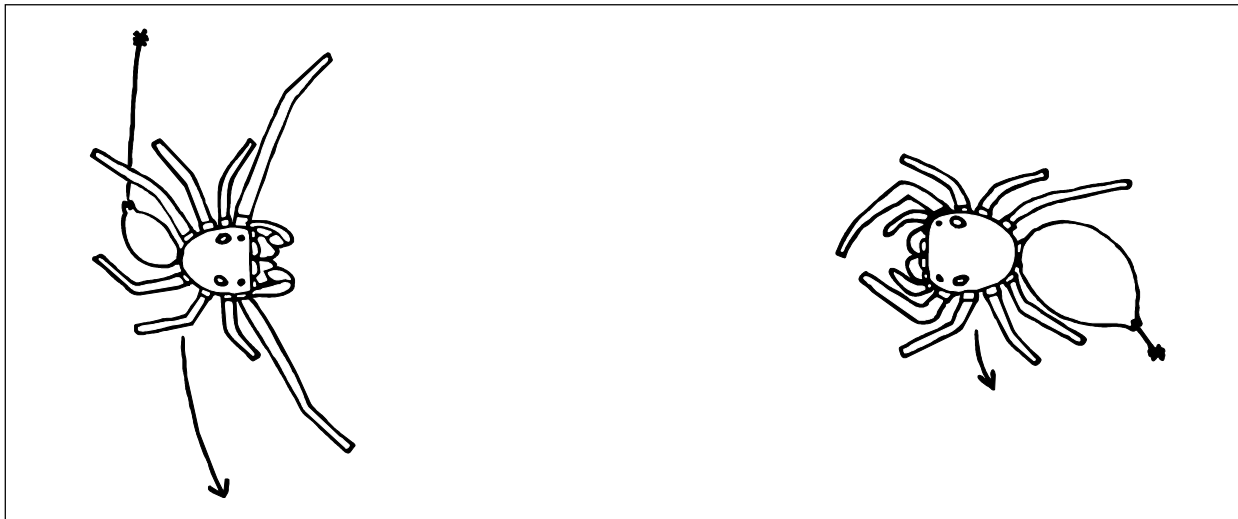


Fig. 3. Sequential (alternating) movements of the adult male (left) and adult female *P.princeps* during courtship in an open arena. Side-stepping by the male alternates with orienting turns of the female, in place.

This alternate turning continued until the male had completely described a circle about the female. The defensive aspect of this "courtship" stance of the male, with its elevation and spread of the forelegs, became immediately apparent whenever the female attacked the male directly, as the powerful forelegs and chelicerae of the male were generally sufficient to fend off this sort of frontal attack. Males only succumbed when they were not aware of the attack of a female from the rear.

On several occasions the female remained motionless as the male advanced although the male was forced to grapple somewhat with her forelegs before he could mount from the front. In this case the forelegs of the male, still elevated, were directed forward, toward the female, rather than laterally outstretched, as the male approached to grapple and touch the female.

Even when the female permitted the approach of the male, mating was, with a single exception, of very short duration- generally for less than one minute.

In contrast to the failure of this mating in an open arena, a series of 8 males placed directly into petri dishes containing resident females mated successfully, without exception. They entered the resting sacs of the females and mounted them immediately after introduction, or shortly thereafter (Fig. 4). Mating between individuals continued at intervals for at least 4 days, after which time several of the females did devour their captive mates.

It appears that several conclusions can be drawn from this, as well as from similar results with a smaller number of P.audax. First, defensive aspects of the "courtship" postures are paramount considerations, particularly in those salticid species which are prone to cannibalism.

Secondly, even if cohabitation of the sexes within a single resting sac is not a prerequisite for mating under natural conditions, it is nonetheless probably the most successful form of courtship for some jumping spiders.

The results of Jackson (1976) with P.johnsoni, as well as my own field observations of P.clarus (P.rimator) and Eris marginata suggest that salticid

cohabitation may be of wide occurrence in nature. Clearly a series of careful field studies on this subject will be required before any detailed appraisal of the extent of cohabitation in the Salticidae will be possible.

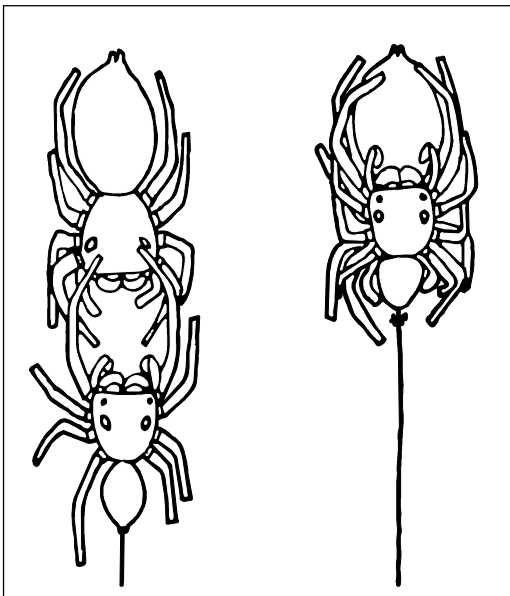


Fig. 4. Approach of male P.princeps to female in resting sac. In this case the male, already familiar with the female for at least one week (continuous residence in the same petri dish), exhibits the same tactile overture with legs I seen in males attempting to mate upon entrance to the sac of the female (left), but then assumes a stationary position within the sac, with all legs in contact with the body of the female (right). This position was maintained for at least two hours, if not longer. In this position, the body axes of the male and female are in complete alignment, and the limbs of the male are arranged in distinct bilateral symmetry.

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- JACKSON, R.R. 1976. The evolution of courtship and mating tactics in a jumping spider, Phidippus johnsoni (Araneae: Salticidae). Ph.D. Thesis, University of California, Berkeley. 271 p.